

## SEQUENCE LISTING

<110> Japan Science and Technology Corporation

<120> Hollow nano-particles composed of cysteine-modified proteins, and  
their use as a therapeutic drug

<130> P023P05

<150> JP2002-191386

<151> 2002-6-28

<150> JP2003-183863

<151> 2003-6-27

<160> 36

<170> PatentIn Ver. 2.1

<210> 1

<211> 1218

<212> DNA

<213> Hepatitis B virus

<220>

<221> CDS

<222> (1)..(1218)

<400> 1

atg aga tct ttg ttg atc ttg gtt ttg tgt ttc ttg cca ttg gct gct 48  
Met Arg Ser Leu Leu Ile Leu Val Leu Cys Phe Leu Pro Leu Ala Ala  
1 5 10 15

ttg ggt aag gtt cga caa ggc atg ggg acg aat ctt tct gtt ccc aat 96  
Leu Gly Lys Val Arg Gln Gly Met Gly Thr Asn Leu Ser Val Pro Asn

20	25	30	
cct ctg gga ttc ttt ccc gat cac cag ttg gac cct gcg ttc gga gcc 144			
Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala			
35	40	45	
aac tca aac aat cca gat tgg gac ttc aac ccc aac aag gat caa tgg 192			
Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Gln Trp			
50	55	60	
cca gag gca aat cag gta gga gcg gga gca ttc ggg cca ggg ttc acc 240			
Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe Gly Pro Gly Phe Thr			
65	70	75	80
cca cca cac ggc ggt ctt ttg ggg tgg agc cct cag gct cag ggc ata 288			
Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile			
85	90	95	
ttg aca aca gtg cca gca gca cct cct cct gcc tcc acc aat cgg cag 336			
Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln			
100	105	110	
tca gga aga cag cct act ccc atc tct cca cct cta aga gac agt cat 384			
Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His			
115	120	125	
cct cag gcc atg cag tgg aat tcc aca aca ttc cac caa gct ctg cta 432			
Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu			
130	135	140	
gat ccc aga gtg agg ggc cta tat ttt cct gct ggt ggc tcc agt tcc 480			
Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser			
145	150	155	160
gga aca gta aac cct gtt ccg act act gcc tca ccc ata tct ggg gac 528			
Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Gly Asp			

165	170	175	
cct gca ccg aac atg gag aac aca aca tca gga ttc cta gga ccc ctg    576			
Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu			
180	185	190	
ctc gtg tta cag gcg ggg ttt ttc ttg ttg aca aga atc ctc aca ata    624			
Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile			
195	200	205	
cca cag agt cta gac tcg tgg tgg act tct ctc aat ttt cta ggg gga    672			
Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly			
210	215	220	
gca ccc acg tgt cct ggc caa aat tcg cag tcc cca acc tcc aat cac    720			
Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His			
225	230	235	240
tca cca acc tct tgt cct cca att tgt cct ggc tat cgc tgg atg tgt    768			
Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys			
245	250	255	
ctg cgg cgt ttt atc ata ttc ctc ttc atc ctg ctg cta tgc ctc atc    816			
Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile			
260	265	270	
ttc ttg ttg gtt ctt ctg gac tac caa ggt atg ttg ccc gtt tgt cct    864			
Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro			
275	280	285	
cta ctt cca gga aca tca acc acc agc acg ggg cca tgc aag acc tgc    912			
Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys			
290	295	300	
acg att cct gct caa gga acc tct atg ttt ccc tct tgt tgc tgt aca    960			
Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr			

### <213> Hepatitis B virus

Met Arg Ser Leu Leu Ile Leu Val Leu Cys Phe Leu Pro Leu Ala Ala

15

Leu Gly Lys Val Arg Gln Gly Met Gly Thr Asn Leu Ser Val Pro Asn  
 20 25 30

Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala  
 35 40 45

Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn Lys Asp Gln Trp  
 50 55 60

Pro Glu Ala Asn Gln Val Gly Ala Gly Ala Phe Gly Pro Gly Phe Thr  
 65 70 75 80

Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile  
 85 90 95

Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Ala Ser Thr Asn Arg Gln  
 100 105 110

Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His  
 115 120 125

Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu  
 130 135 140

Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser  
 145 150 155 160

Gly Thr Val Asn Pro Val Pro Thr Thr Ala Ser Pro Ile Ser Gly Asp  
 165 170 175

Pro Ala Pro Asn Met Glu Asn Thr Thr Ser Gly Phe Leu Gly Pro Leu  
 180 185 190

Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile  
 195 200 205

Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly  
 210 215 220

Ala Pro Thr Cys Pro Gly Gln Asn Ser Gln Ser Pro Thr Ser Asn His  
 225 230 235 240

Ser Pro Thr Ser Cys Pro Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys  
 245 250 255

Leu Arg Arg Phe Ile Ile Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile  
 260 265 270

Phe Leu Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro  
 275 280 285

Leu Leu Pro Gly Thr Ser Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys  
 290 295 300

Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Cys Cys Cys Thr  
 305 310 315 320

Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp  
 325 330 335

Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser Trp  
 340 345 350

Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser Pro  
 355 360 365

Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro Ser  
 370 375 380

Leu Tyr Asn Ile Leu Ser Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe  
 385 390 395 400

Cys Leu Trp Val Tyr Ile

405

<210> 3

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 3

gcaccacgt ctcctggcca aaattc

26

<210> 4

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 4

gaattttggc caggagacgt ggggtgc

26

<210> 5

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 5

tcaccaacct ctagtcctcc aatttg

26

<210> 6

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 6

caaattggag gactagaggt tggatga

26

<210> 7

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 7

ctgtcctcc aataagtcct ggctatcg

28

<210> 8

<211> 28



<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 8

cgatagccag gacttattgg aggacaag

28

<210> 9

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 9

tatcgctgga tggcgctgcg gcgttttata

30

<210> 10

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 10

aaaacgccgc agcgccatcc agcgatagcc

30

<210> 11

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 11

catcctgctg ctaccctca tcttcttg

28

<210> 12

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 12

caagaagatg agggctagca gcaggatg

28

<210> 13

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

&lt;400&gt; 13

atgttgcccg ttgcgcctct acttcca

27

&lt;210&gt; 14

&lt;211&gt; 27

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

&lt;400&gt; 14

tggaagtaga ggcgcaacgg gcaacat

27

&lt;210&gt; 15

&lt;211&gt; 30

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

&lt;400&gt; 15

agcacggggc cttcgaagac ctgcacgatt

30

&lt;210&gt; 16

&lt;211&gt; 30

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 16

gtgcaggtct tcgaaggccc cgtgctggtg

30

<210> 17

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 17

ccatgcaaga cctcgacgat tcttgct

27

<210> 18

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 18

agcaggaatc gtcgaggtct tgcattgg

27

<210> 19

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 19

atgtttccct ctagttgctg tacaa

25

<210> 20

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 20

ttgtacagca actagaggga aacat

25

<210> 21

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 21

tttcctctt gcagctgtac aaaac

25

<210> 22

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 22

ttttgtacag ctgcaagagg gaaac

25

<210> 23

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 23

cctcttgttg ctcgacaaaa ccttcg

26

<210> 24

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 24

cgaaggtttt gtcgagcaac aagagg

26

<210> 25

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 25

tcggacggaa acagcacttg tattcc

26

<210> 26

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 26

ggaatacaag tgctgtttcc gtccga

26

<210> 27

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially

## Synthesized Primer Sequence

&lt;400&gt; 27

cggaaactgc acggccattc ccatccca

28

&lt;210&gt; 28

&lt;211&gt; 28

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

&lt;400&gt; 28

tgggatggga atggccgtgc agtttccg

28

&lt;210&gt; 29

&lt;211&gt; 28

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

&lt;400&gt; 29

accaattttc tttgcgttt gggatac

28

&lt;210&gt; 30

&lt;211&gt; 28

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence



<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 30

gtatacccaa agcgcaaaga aaattggt

28

<210> 31

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 31

ccttcggacg gaaacagcac ggccattccc

30

<210> 32

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 32

gggaatggcc gtgctgttgc cgtccgaagg

30

<210> 33

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 33

tttcctctt gtgctcgac aaaac

25

<210> 34

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 34

gtttgtcga gctacaagag ggaaa

25

<210> 35

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 35

atgtttccct cttctagctc gacaa

25



<210> 36

<211> 25

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Artificially  
Synthesized Primer Sequence

<400> 36

ttgtcgagct agaagaggga aacat

25